

WHAT IS CLAIMED IS:

1. A streaming method in which a server transmits stream data to a terminal over a network, and the terminal plays back the stream data while receiving the same, said method comprising:

5 a target value determination step of determining, by the terminal, a target value of the stream data to be stored in a buffer of the terminal in relation to a buffer capacity and a transmission capacity of the network,

10 a delay time determination step of arbitrarily determining a delay time from when the terminal writes head data of the stream data to the buffer to when the terminal reads the data to start playback, by the terminal, in a range not exceeding a value obtained by dividing the buffer capacity by the transmission capacity;

15 a step of notifying, by the terminal, the determined target value and the delay time to the server; and

a control step of controlling a transmission speed based on the notified target value and the delay time when the server transmits the stream data to the terminal over the network.

2. The streaming method according to claim 1, wherein in said control step, the server controls the transmission speed so that an amount of the stream data stored in the buffer of the

terminal changes in the vicinity of the target value without  
5 exceeding the target value.

3. The streaming method according to claim 2, wherein  
in said control step, the server estimates and calculates the  
amount of the stream data stored in the buffer of the terminal  
based on the transmission speed, the delay time, and a speed of  
5 the terminal decoding the stream data.

4. The streaming method according to claim 1, further  
comprising:

a detection step of detecting, by the terminal, that  
the transmission capacity of the network exceeds a predetermined  
5 threshold value;

a target value change step of changing, by the terminal,  
the target value based on a result detected in said detection step;  
and

a step of notifying, by the terminal, a new target value  
10 after the change to the server, wherein

in said control step, when receiving the new target  
value after the change, the server controls the transmission speed  
so that the amount of the stream data stored in the buffer of the  
terminal changes in the vicinity of the new target value after  
15 the change without exceeding the new target value after the  
change.

5. The streaming method according to claim 4, wherein  
in said detection step, when detecting the transmission  
capacity of the network as being fall short of a first threshold  
value, the terminal controls the target value to be increased in  
5 said target value change step, and

in said control step, responding to the target value  
as being increased, the server controls the transmission speed  
to be increased.

6. The streaming method according to claim 5, wherein  
the first threshold value is approximately a median value of an  
achievable maximum transmission capacity and a transmission  
capacity with which a stream data transfer loss starts occurring.

7. The streaming method according to claim 4, wherein  
in said detection step, when detecting that the  
transmission capacity of the network as being fall short of a  
second threshold value which is smaller than the first threshold  
5 value, the terminal controls the target value to be decreased in  
said target value change step, and

in said control step, responding to the target value  
as being decreased, the server controls the transmission speed  
to be decreased.

8. The streaming method according to claim 7, wherein

the second threshold value is a value corresponding to the transmission capacity with which the stream data transfer loss starts occurring.

9. The streaming method according to claim 8, wherein when the terminal controls the target value to be decreased in said target value change step, in said control step, the server controls the transmission speed to be decreased by comparing a presentation time of every frame structuring the stream data to be transmitted with a current time, and skipping transmitting any frame whose presentation time is older than the current time.

10. The streaming method according to claim 8, wherein when the terminal controls the target value to be decreased in said target value change step, in said control step, the server

compares a priority level of every frame structuring the stream data to be transmitted with a reference value, skips transmitting every frame whose priority level is lower than the reference value, and

for any frame whose priority level is higher than the reference value, compares every presentation time with the current time, and skips transmitting any frame whose presentation time is older than the current time.

11. A system including a server for transmitting stream data over a network, and a terminal for playing back the stream data while receiving the same,

said terminal comprises:

5           target value determination means for determining a target value of stream data to be stored in a buffer of the terminal in relation to a buffer capacity and a transmission capacity of the network;

10           delay time determination means for arbitrarily determining, in a range not exceeding a value obtained by dividing the buffer capacity by the transmission capacity, a delay time from when the terminal writes head data of the stream data to the buffer to when the terminal reads the data to start playback; and

15           means for notifying the determined target value and the delay time to the server; and

said server comprises control means for controlling a transmission speed based on the notified target value and the delay time when transmitting the stream data to the terminal over the network.

12. A terminal working with a server for transmitting stream data over a network, and playing back the stream data while receiving the same, and

5           said server comprises control means for controlling a transmission speed based on a target value and a delay time when

transmitting the stream data to the terminal over the network,  
and

said terminal comprises:

target value determination means for determining  
10 the target value of the stream data to be stored in a in relation  
to a buffer capacity of the terminal and a transmission capacity  
of the network;

delay time determination means for arbitrarily  
determining, in a range not exceeding a value obtained by dividing  
15 the buffer capacity by the transmission capacity, the delay time  
from when the terminal writes head data of the stream data to the  
buffer to when the terminal reads the data to start playback; and

means for notifying the determined target value and  
the delay time to the server.

13. A server for transmitting stream data over a  
network, and working together with a terminal for playing back  
the stream data while receiving the same,

said terminal comprises:

5 target value determination means for determining a  
target value of the stream data to be stored in a buffer of the  
terminal in relation to a buffer capacity and a transmission  
capacity of the network;

delay time determination means for arbitrarily

10 determining, in a range not exceeding a value obtained by dividing  
the buffer capacity by the transmission capacity, a delay time  
from when the terminal writes head data of the stream data to the  
buffer to when the terminal reads the data to start playback; and  
means for notifying the determined target value and  
15 the delay time to the server; and

said server comprises control means for controlling a  
transmission speed based on the notified target value and the  
delay time when the server transmits the stream data to the  
terminal over the network, wherein

20 said control means controls the transmission speed so  
that the amount of the stream data stored in the buffer of the  
terminal changes in the vicinity of the target value without  
exceeding the target value.

14. A program describing a streaming method in which  
a server transmits stream data to a terminal through a network,  
and the terminal plays back the stream data while receiving the  
same, said method comprising:

5 a target value determination step of determining, by  
the terminal, a target value of the stream data to be stored in  
a buffer of the terminal in relation to a buffer capacity and a  
transmission capacity of the network,

a delay time determination step of arbitrarily  
10 determining, by the terminal, in a range not exceeding a value

obtained by dividing the buffer capacity by the transmission capacity, a delay time from when the terminal writes head data of the stream data to the buffer to when the terminal reads the data to start playback;

15           a step of notifying, by the terminal, the determined target value and the delay time to the server; and

          a control step of controlling a transmission speed based on the notified target value and the delay time when the server transmits the stream data to the terminal over the network.

15. A recording medium on which a program is recorded, and the program describes a streaming method in which a server transmits stream data to a terminal through a network, and the terminal plays back the stream data while receiving the same, said  
5   program comprising:

          a target value determination step of determining, by the terminal, a target value of the stream data to be stored in a buffer of the terminal in relation to a buffer capacity and a transmission capacity of the network,

10           a delay time determination step of arbitrarily determining, by the terminal, in a range not exceeding a value obtained by dividing the buffer capacity by the transmission capacity, a delay time from when the terminal writes head data of the stream data to the buffer to when the terminal reads the  
15   data to start playback;



a step of notifying, by the terminal, the determined target value and the delay time to the server; and

a control step of controlling a transmission speed based on the notified target value and the delay time when the  
20 server transmits the stream data to the terminal over the network.